

REMARKS

Claims 2-5, 14-16, 20-22 are all the claims pending in the application. Claims 2-5 and 20-22 have been withdrawn from consideration by the Examiner. Reconsideration and allowance of all the claims are respectfully requested in view of the following.

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 14 and 16 under §103(a) as being unpatentable over JP 61-074791 to Sugawara (hereinafter Sugawara) in view of JP 03-142087 to Inagawa et al. (hereinafter Inagawa). Applicants respectfully traverse this rejection because the references fail to teach or suggest all of the elements as set forth in the claims.

The Examiner continues to mistakenly rely on Sugawara as teaching “partially removing the metallic layer by pulse irradiation with a laser beam ...”. As noted in the previous reply, filed October 14, 2004, Sugawara instead teaches removing a copper layer by etching with acid, and then irradiating with a laser the portion of the circuit board where the copper was removed by etching. Applicants thus hereby incorporate by reference the arguments against Sugawara as set forth in the October 14 response at pages 2 and 3.

Inagawa discloses using two types of laser beams which are different in wavelength, and changing process conditions dependent on whether the resin part or the foil part will be processed. A high-speed processing utilizing a high output of a long-wavelength laser and a clear processing utilizing a high photo energy of a short-wavelength laser are carried out by this combination, if necessary. Specifically, a copper foil part 16B (Fig. 2(a)) of a printed board 16 provided with a glass epoxy copper extended laminated plate is removed by means of an excimer laser beam 4a having a short wavelength (KrF: wavelength $\lambda = 248$ nm), while a resin part 16A (Fig. 2(b)) is removed by means of a CO₂ gas laser beam 4b having a long wavelength (wavelength $\lambda = 10.6$ μ m).

However, the cited references neither teach nor suggest the following features as presently claimed:

forming the metallic layer having a desired shape by partially removing the metallic layer by pulse irradiation with a laser beam having sufficient intensity to melt and remove the metallic layer; and

additionally irradiating a machined portion of the wiring board through the metallic layer removed portion with the laser beam having insufficient intensity to melt the metallic layer and a beam irradiation time ranging from 10 to 200 μ s, and including a plurality of pulses forming a train at intervals of a beam irradiation pausing time of 15 ms or more.

In a telephone conversation conducted with the Examiner on March 22, 2005, the Examiner agreed that Sugawara fails to teach removing copper foil by a laser beam. The Examiner further indicated that Inagawa fails to make up for the deficiencies in Sugawara. Applicants thank the Examiner for the courtesy extended to their representative during the telephone conversation.

In light of the above, Applicants respectfully request that the Examiner withdraw this rejection.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claim 15 would be allowable if rewritten in independent form. However, because of the belief that claim 14 is allowable as written, Applicants have not rewritten claim 15 at this time.

Conclusion

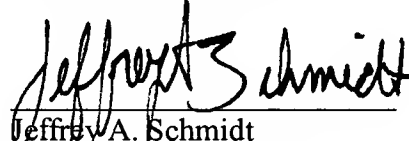
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Response Under 37 C.F.R. §1.111
US Appln. 09/994,719

Atty. Docket: Q67200

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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